# FCC TEST REPORT

**REPORT NO.:** RF89122808
**MODEL NO.:** WX-1560
**RECEIVED:** December 28, 2000
**TESTED:** February 9, 2001

**APPLICANT:** GemTek Technology Co., Ltd.

**ADDRESS:** No.1, Jen Ai Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** 13-1, Lane 19, Wen Shan 3rd St., Kweishan, Taoyuan Hsien, Taiwan, R.O.C.

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Accredited Laboratory

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ANNEX PHOTOGRAPHS OF EUT

# 1 CERTIFICATION

| | |
|---|---|
| **PRODUCT :** | 2.4GHz Wireless Access Point |
| **BRAND NAME :** | GemTek |
| **MODEL NO. :** | WX-1560 |
| **APPLICANT :** | GemTek Technolgy Co., Ltd. |
| **OEM BRAND NAME :** | Xircom |
| **MODEL NO. :** | APWE1100 |
| **STANDARDS :** | 47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992 |
| **SITE REGISTERATION NO. :** | 90422 (FCC)<br>IC 3789-5 (Canada IC) |

We, **Advance Data Technology Corporation**, hereby certify that one sample WX-1560 of the designation has been tested in our facility on February 9, 2001.

The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

| | | | |
|---|---|---|---|
| Tested by | : Steven Lu<br>Steven Lu | Date: | Feb. 12, 2001 |
| Prepared by | : Demi Chen<br>Demi Chen | Date: | Feb. 12, 2001 |
| Approved by | : Alan Lane<br>Dr. Alan Lane, Manager | Date: | Feb. 12, 2001 |

# 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: 47 CFR Part 15, Subpart C | | | |
|---|---|---|---|
| **STANDARD PARAGRAPH** | **TEST REQUIREMENTS** | **RESULT** | **REMARK** |
| 15.107 | AC Power Conducted Emissions<br>Spec.: 48 dBuV | Yes | Minimum passing margin is –7.22dBuV At 13.65027MHz |
| 15.247(a)(2) | Spectrum Bandwidth of a Direct Sequence Spread Spectrum System<br>Spec.: min. 500 Khz | Yes | 8.82 MHz > 500 kHz |
| 15.247(b) | Maximum Peak Output Power<br>Spec.: max. 30 dBm | Yes | 17.64 dBm < 30 dBm |
| 15.247(c) | Transmitter Radiated Emissions<br>Spec.: Table 15.209 | Yes | Minimum passing margin is –5.7 dBuV At 747.98 MHz |
| 15.247(d) | Power Spectral Density<br>Spec.: max. 8dBm | Yes | -10.56 dBm < 8 dBm |
| 15.247(c) | Band Edge Measurement | Yes | N/A |
| 15.247(e) | Processing Gain of Direct Sequence Spread Spectrum System<br>Spec.: min. 10 dB | Yes | 11.4dB≧10dB |

NOTE:

The receiver portion of the EUT has been tested in ADT. The test result has been verified to comply with FCC Part 15, Subpart B, Class B – Computing Devices (FCC DoC). The engineering test report can be provided upon FCC requests.

# 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **PRODUCT** | 2.4GHz Wireless Access Point |
| **MODEL NO.** | WX-1560 |
| **POWER SUPPLY** | 5VDC from power adapter |
| **DATA CABLE** | RJ45 Cable(Nonshielded) |
| **I/O PORTS** | RJ45 Port |
| **MODULATION TYPE** | CCK, BPSK, QPSK |
| **RADIO TECHNOLOGY** | DSSS |
| **TRANSFER RATE** | 1/2/5.5/11Mbps |
| **FREQUENCY RANGE** | 2412MHz ~ 2462MHz |
| **NUMBER OF CHANNEL** | 11 |
| **OUTPUT POWER** | 13dBm |
| **ANTENNA TYPE** | dual sleeve dipole |
| **ASSOCIATED DEVICES** | NA |
| **DESCRIPTION BETWEEN MODELS** | This device is connected with notebook through RJ45 port. |

## 3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 1 | 2412 MHz | 7 | 2442 MHz |
| 2 | 2417 MHz | 8 | 2447 MHz |
| 3 | 2422 MHz | 9 | 2452 MHz |
| 4 | 2427 MHz | 10 | 2457 MHz |
| 5 | 2432 MHz | 11 | 2462 MHz |
| 6 | 2437 MHz | | |

## 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a 2.4GHz Wireless Access Point, according to the specifications of the manufacturers, it must comply with the requirements of the following standards:

**FCC CFR 47 Part 15, Subpart C. (15.247)**

All tests have been performed and recorded as per the above standards.

## 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| No | Product | Brand | Model No. | Serial No. | I/O Cable |
|---|---|---|---|---|---|
| 1 | NOTEBOOK | DELL | PPX | 99125 | Nonshielded Signal (10m) |
| 3 | WIRELESS LAN CARD | DELL | 3CCFE575CT-D | NA | NA |

## 3.5 TEST SETUP

Please refer to the photos of test configuration.

# 4 TEST PROCEDURES AND TEST RESULTS

## 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.45 – 30 | 48 | - | 48 | - |
| | | | | |
| | | | | |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Test Receiver | ESHS30 | 828109/007 | July 6, 2001 |
| ROHDE & SCHWARZ Artificial Mains Network | ESH3-Z5 | 839135/006 | July 9, 2001 |
| ROHDE & SCHWARZ 4-wire ISN | ENY41 | 835154/007 | Apr. 26, 2001 |
| EMCO-L.I.S.N. | 3825/2 | 9204-1964 | July 9, 2001 |
| Shielded Room | Site 2 | ADT-C02 | NA |

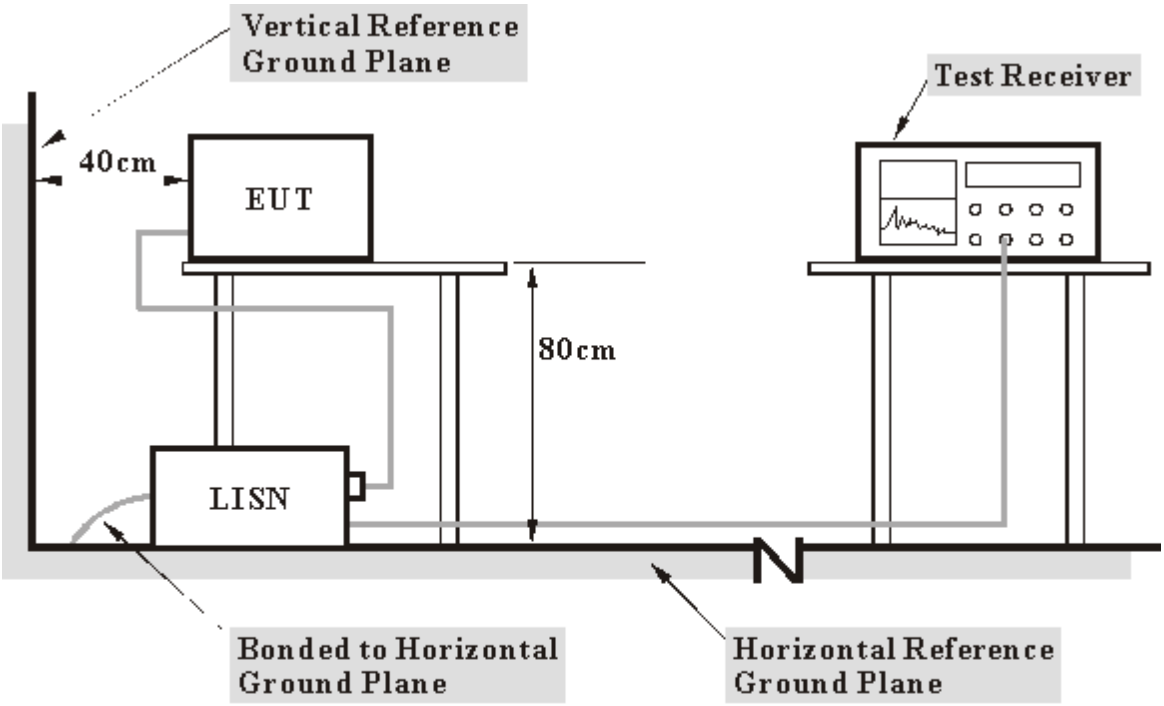
Notes:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months.
   And the calibrations are traceable to NML/ROC and NIST/USA.

### 4.1.3 TEST PROCEDURES

1. Place the EUT at 0.4 meter away from the conduction wall of the shielded room.
2. Connect the EUT to the power mains through a Line Impedance Stabilization Network (LISN).
3. Connect the other support units to the other LISN too.
4. Make sure the 50Ω/ 50μH coupling impedance is provided to the measurement instrument by the LISNs.
5. Measure the maximum conducted interference on both lines of the power mains connects to the EUT, within frequency range 450KHz ~ 30MHz.
6. The emission level under limit by 10dB is not needed to be reported.

### 4.1.4 TEST SETUP




Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

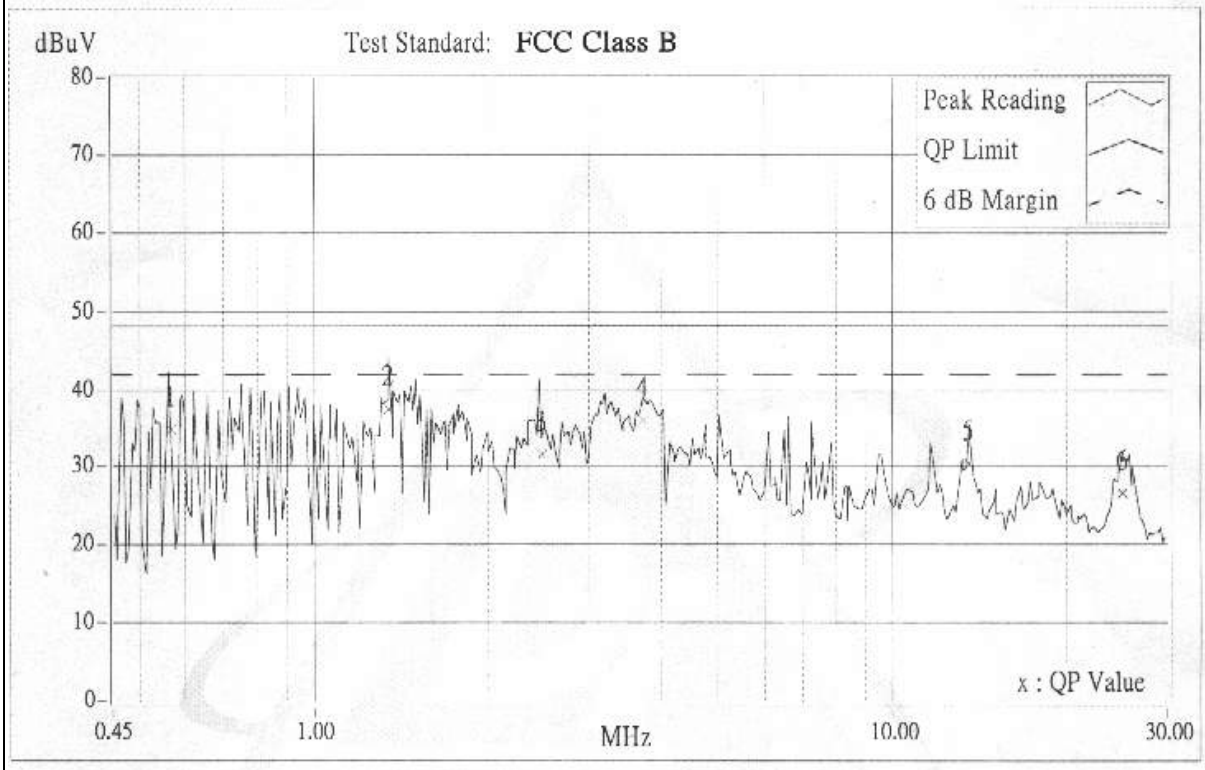
For the actual test configuration, please refer to the related Item in this test report ( **Photographs of the Test Configuration**).

## 4.1.5 TEST RESULTS

Brand / Model : WX-1560
Test Mode : CH1
Power Source :
Remark :
Tested by : STEVEN

Location: Conduction 2 Date: 2001/2/9 Time: PM 04:57:10 Phase: L1

Temperatuer (C): 20 Humidity (%): 60 Approved by:

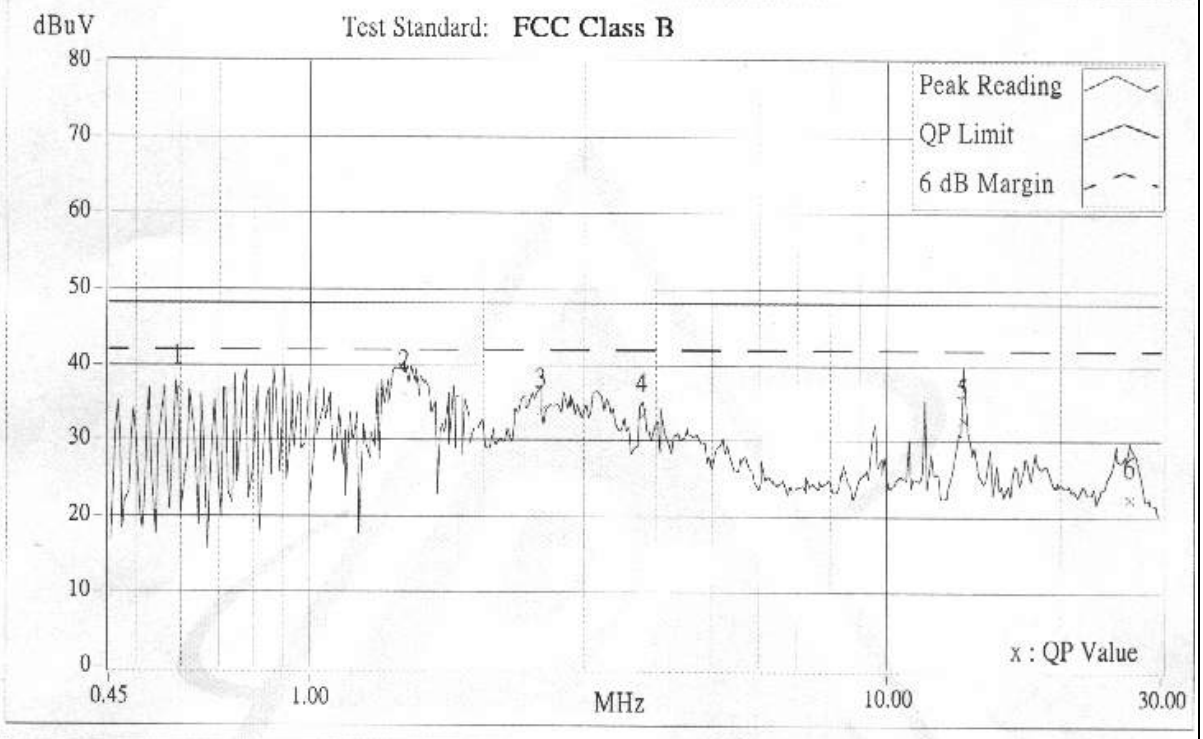



| | Frequency | Corr. Factor | Reading dBuV | Emission dBuV | Limit dBuV | Margins dB | Notes |
|---|---|---|---|---|---|---|---|
| No. | MHz | dB | QP | QP | QP | QP | |
| 1 | 0.56638 | 0.20 | 34.79 | 34.99 | 48.00 | -13.01 | |
| +2 | 1.34065 | 0.20 | 37.63 | 37.83 | 48.00 | -10.17 | |
| 3 | 2.46554 | 0.25 | 31.46 | 31.71 | 48.00 | -16.29 | |
| 4 | 3.72037 | 0.37 | 35.92 | 36.29 | 48.00 | -11.71 | |
| 5 | 13.65155 | 0.92 | 30.45 | 31.37 | 48.00 | -16.63 | |
| 6 | 25.00653 | 1.40 | 26.57 | 27.97 | 48.00 | -20.03 | |

Brand / Model : WX-1560
Test Mode :CH1
Power Source :
Remark :
Tested by : STEVEN

Location: Conduction 2 Date: 2001/2/9 Time: PM 04:48:33 Phase: N

Temperatuer (C): 20 Humidity (%): 60 Approved by:

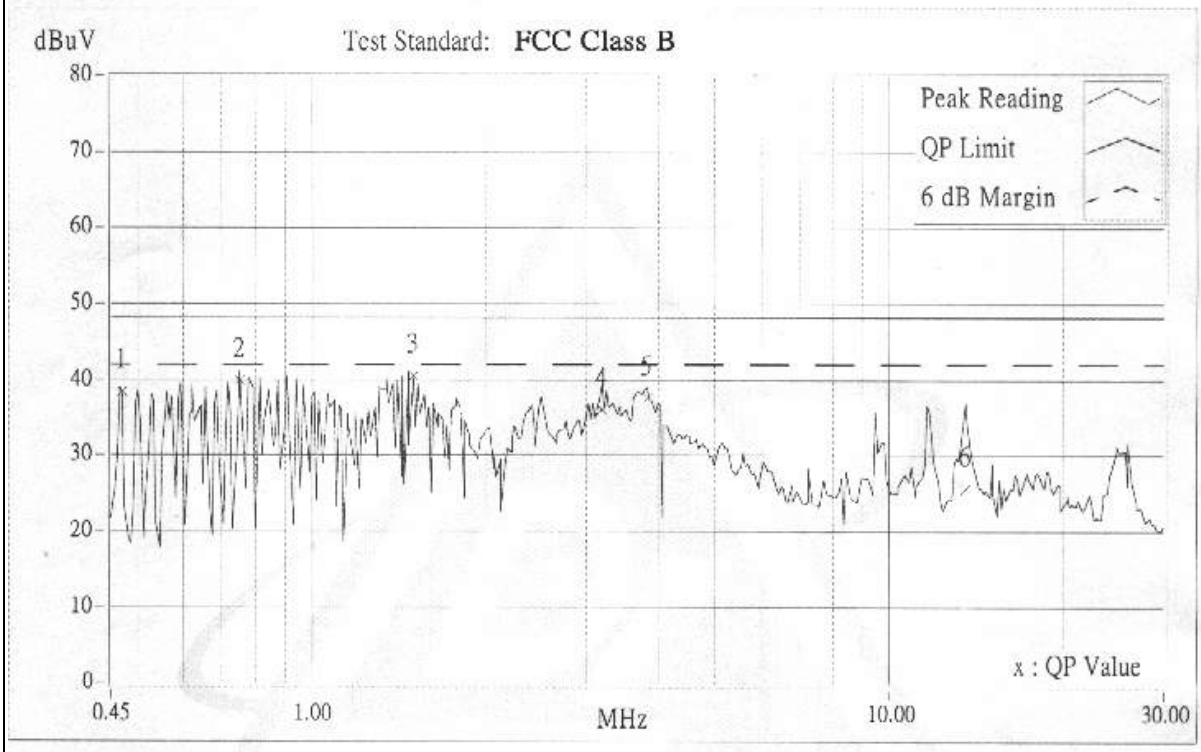



| | Frequency | Corr. Factor | Reading dBuV | Emission dBuV | Limit dBuV | Margins dB | Notes |
|---|---|---|---|---|---|---|---|
| No. | MHz | dB | QP | QP | QP | QP | |
| +1 | 0.59227 | 0.20 | 36.81 | 37.01 | 48.00 | -10.99 | |
| 2 | 1.46100 | 0.20 | 36.19 | 36.39 | 48.00 | -11.61 | |
| 3 | 2.52591 | 0.25 | 33.82 | 34.07 | 48.00 | -13.93 | |
| 4 | 3.77007 | 0.38 | 33.26 | 33.64 | 48.00 | -14.36 | |
| 5 | 13.64998 | 0.82 | 32.80 | 33.62 | 48.00 | -14.38 | |
| 6 | 26.36806 | 1.33 | 22.47 | 23.80 | 48.00 | -24.20 | |

Brand / Model : WX-1560
Test Mode : CH6
Power Source :
Remark :
Tested by : STEVEN

Location: Conduction 2 Date: 2001/2/9 Time: PM 05:01:04 Phase: L1

Temperatuer (C): 20 Humidity (%): 60 Approved by:

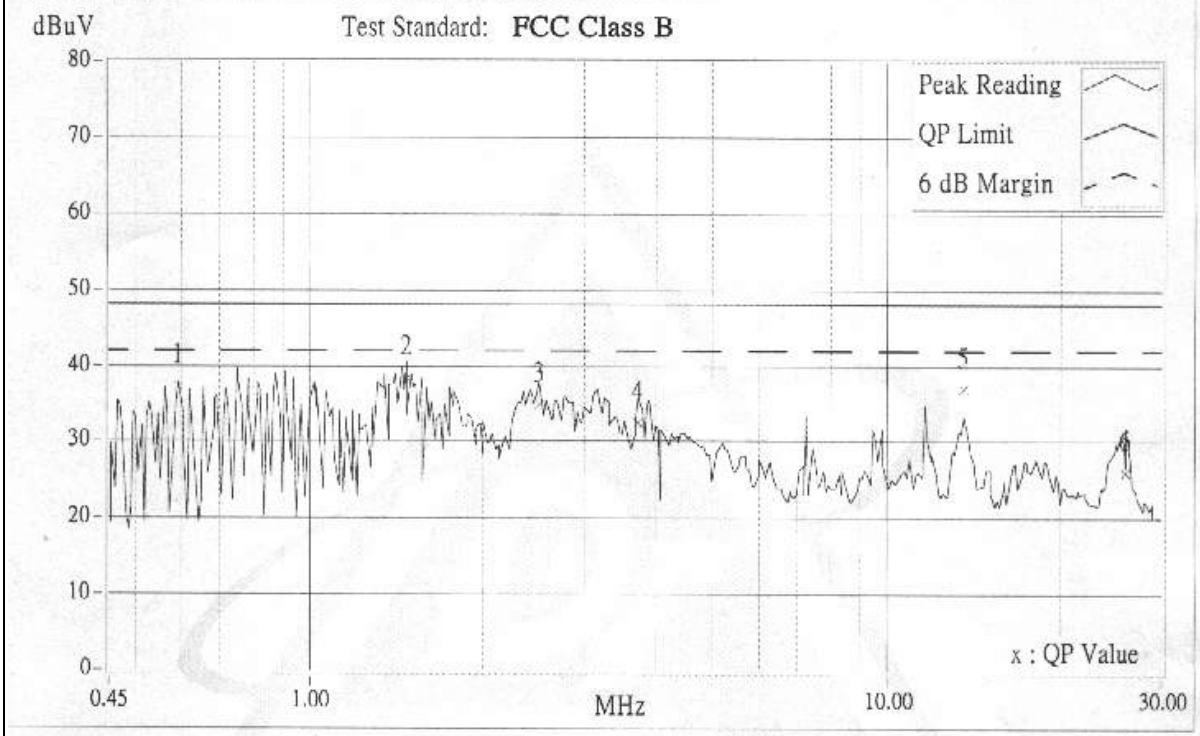



| | Frequency | Corr. Factor | Reading dBuV | Emission dBuV | Limit dBuV | Margins dB | Notes |
|---|---|---|---|---|---|---|---|
| No. | MHz | dB | QP | QP | QP | QP | |
| 1 | 0.47054 | 0.20 | 38.24 | 38.44 | 48.00 | -9.56 | |
| 2 | 0.75252 | 0.20 | 39.88 | 40.08 | 48.00 | -7.92 | |
| +3 | 1.50001 | 0.20 | 40.50 | 40.70 | 48.00 | -7.30 | |
| 4 | 3.19029 | 0.32 | 36.03 | 36.35 | 48.00 | -11.65 | |
| 5 | 3.81300 | 0.38 | 37.40 | 37.78 | 48.00 | -10.22 | |
| 6 | 13.64010 | 0.92 | 25.67 | 26.59 | 48.00 | -21.41 | |

Brand / Model : WX-1560
Test Mode : CH6
Power Source :
Remark :
Tested by : STEVEN

Location: Conduction 2 Date: 2001/2/9 Time: PM 05:04:24 Phase: N

*** This data is for evaluation purposes only. It cannot be used for EMC approvals ***

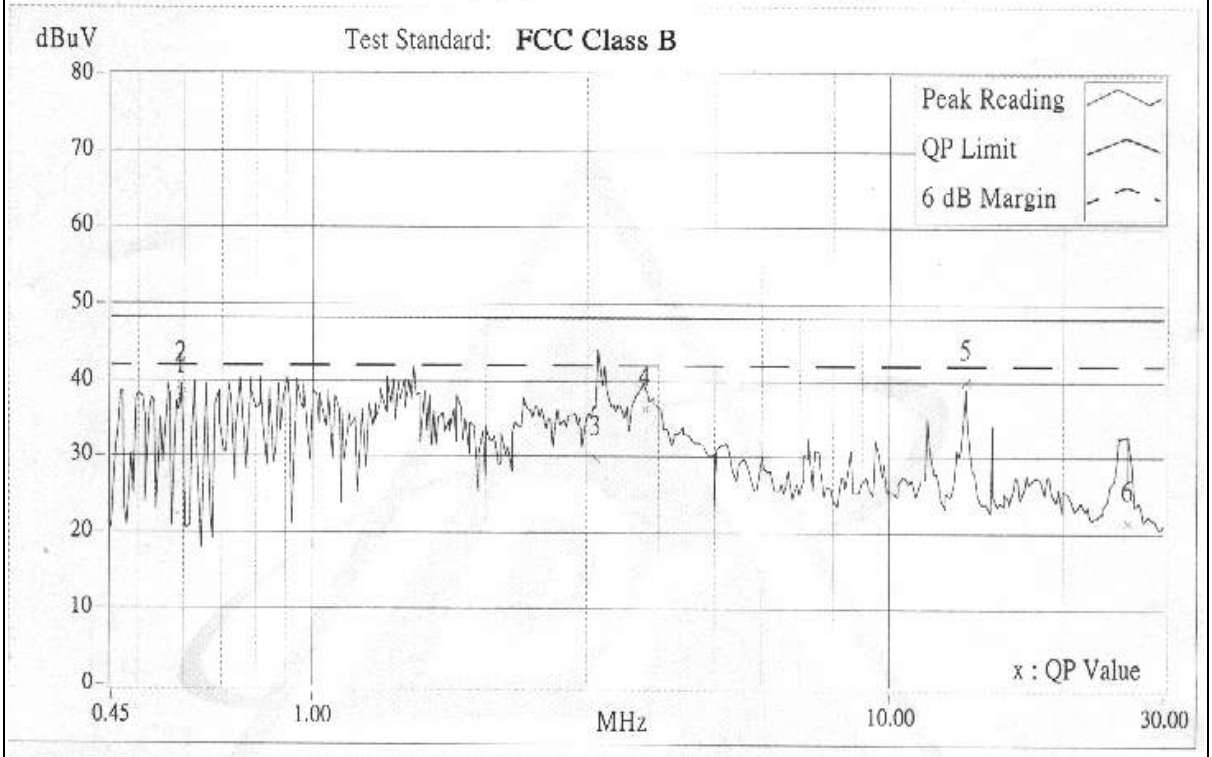



| | Frequency | Corr. Factor | Reading dBuV | Emission dBuV | Limit dBuV | Margins dB | Notes |
|---|---|---|---|---|---|---|---|
| No. | MHz | dB | QP | QP | QP | QP | |
| 1 | 0.59527 | 0.20 | 37.25 | 37.45 | 48.00 | -10.55 | |
| +2 | 1.46765 | 0.20 | 38.27 | 38.47 | 48.00 | -9.53 | |
| 3 | 2.50454 | 0.25 | 34.70 | 34.95 | 48.00 | -13.05 | |
| 4 | 3.71936 | 0.37 | 32.50 | 32.87 | 48.00 | -15.13 | |
| 5 | 13.65069 | 0.82 | 36.98 | 37.80 | 48.00 | -10.20 | |
| 6 | 25.97385 | 1.32 | 26.02 | 27.34 | 48.00 | -20.66 | |

Brand / Model : WX-1560
Test Mode : CH11
Power Source :
Remark :
Tested by : STEVEN

Location: Conduction 2 Date: 2001/2/9 Time: PM 05:12:57 Phase: L1

Temperatuer (C): 20 Humidity (%): 60 Approved by:

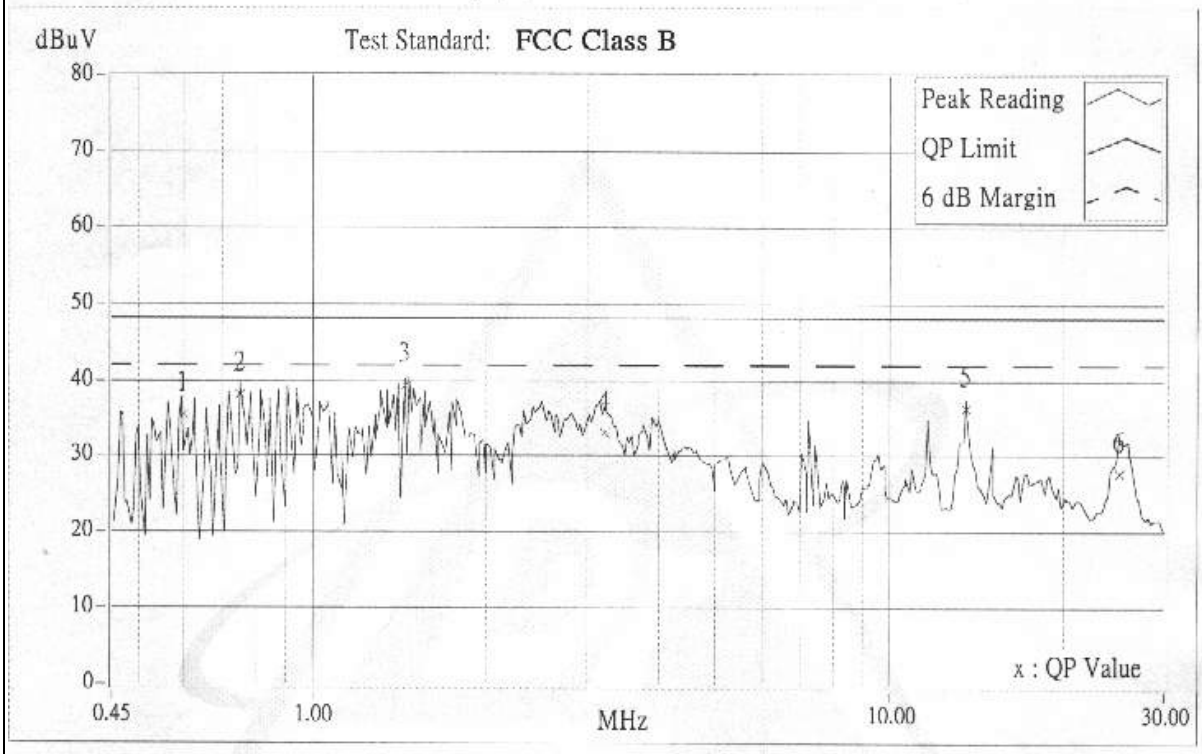



| | Frequency | Corr. Factor | Reading dBuV | Emission dBuV | Limit dBuV | Margins dB | Notes |
|---|---|---|---|---|---|---|---|
| No. | MHz | dB | QP | QP | QP | QP | |
| 1 | 0.59266 | 0.20 | 37.89 | 38.09 | 48.00 | -9.91 | |
| 2 | 0.59522 | 0.20 | 39.31 | 39.51 | 48.00 | -8.49 | |
| 3 | 3.10470 | 0.31 | 29.78 | 30.09 | 48.00 | -17.91 | |
| 4 | 3.75982 | 0.38 | 36.22 | 36.60 | 48.00 | -11.40 | |
| +5 | 13.65027 | 0.92 | 39.86 | 40.78 | 48.00 | -7.22 | |
| 6 | 25.93928 | 1.44 | 21.44 | 22.88 | 48.00 | -25.12 | |

Brand / Model : WX-1560
Test Mode : CH11
Power Source :
Remark :
Tested by : STEVEN

Location: Conduction 2 Date: 2001/2/9 Time: PM 05:09:19 Phase: N

Temperatuer (C): 20 Humidity (%): 60 Approved by:




| | Frequency | Corr. Factor | Reading dBuV | Emission dBuV | Limit dBuV | Margins dB | Notes |
|---|---|---|---|---|---|---|---|
| No. | MHz | dB | QP | QP | QP | QP | |
| 1 | 0.59780 | 0.20 | 35.53 | 35.73 | 48.00 | -12.27 | |
| 2 | 0.75380 | 0.20 | 38.12 | 38.32 | 48.00 | -9.68 | |
| +3 | 1.44128 | 0.20 | 39.37 | 39.57 | 48.00 | -8.43 | |
| 4 | 3.22404 | 0.32 | 33.06 | 33.38 | 48.00 | -14.62 | |
| 5 | 13.65028 | 0.82 | 36.38 | 37.20 | 48.00 | -10.80 | |
| 6 | 25.00656 | 1.30 | 27.79 | 29.09 | 48.00 | -18.91 | |

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| Frequencies (MHz) | Field Strength of Fundamental | |
|---|---|---|
| | µV/meter | dBµV/meter |
| 30-88 | 100 | 40.0 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46.0 |
| Above 960 | 500 | 54.0 |

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

| FREQUENCY (MHz) | Class A (at 10m) | | Class B (at 3m) | |
|---|---|---|---|---|
| | uV/m | dBuV/m | uV/m | dBuV/m |
| Above 1000 | 300 | 49.5 | 500 | 54.0 |

Note: 1 The lower limit shall apply at the transition frequencies.
2 Emission level (dBuV/m) = 20 log Emission level (uV/m).
3 All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| HP Spectrum Analyzer | 8590L | 3544A01176 | Apr. 18, 2001 |
| HP Preamplifier | 8447D | 2944A08485 | Apr. 27, 2001 |
| HP Preamplifier | 8347A | 3307A01088 | Sep. 04, 2001 |
| ROHDE & SCHWARZ TEST RECEIVER | ESMI | 839013/007<br>839379/002 | Aug. 3, 2001 |
| SCHWARZBECK Tunable Dipole Antenna | VHA 9103<br>UHA 9105 | E101051<br>E101055 | N/A |
| CHASE BILOG Antenna | CBL6112A | 2221 | Aug. 4, 2001 |
| SCHWARZBECK Horn Antenna | BBHA9120-D | D130 | Jul. 9, 2001 |
| SCHWARZBECK Horn Antenna | BBHA9170 | 123 | Jan. 30, 2001 |
| EMCO Turn Table | 1060 | 1115 | N/A |
| SHOSHIN Tower | AP-4701 | A6Y005 | N/A |
| Open Field Test Site | Site 5 | ADT-R05 | Aug. 08, 2001 |

Notes:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

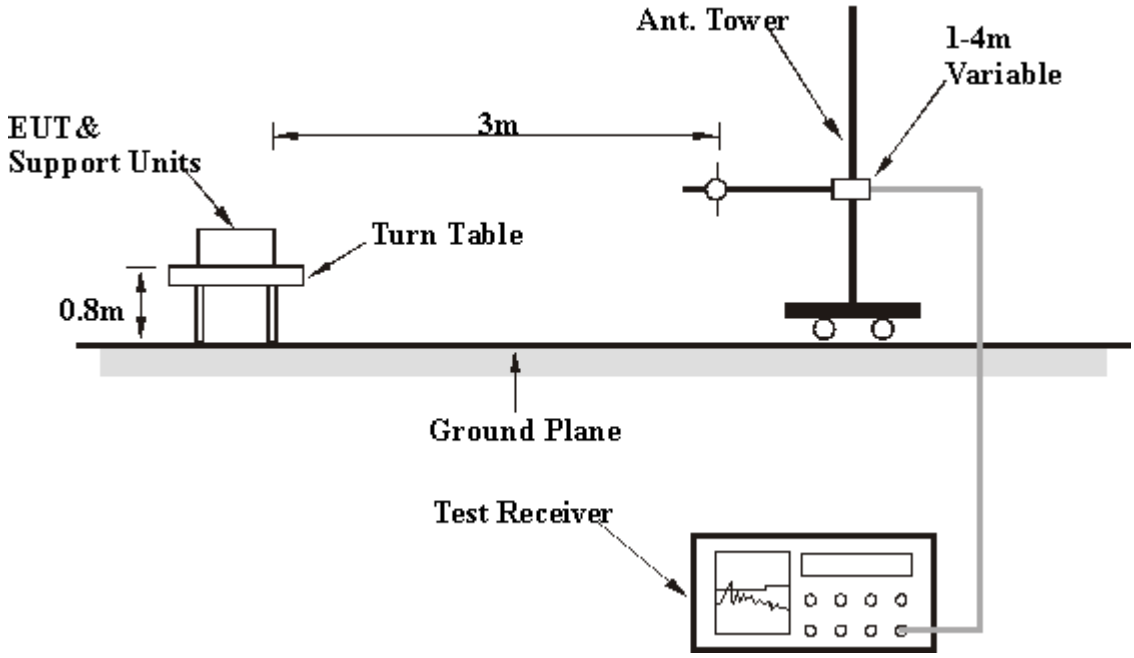
### 4.2.3 TEST PROCEDURES

1. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures C ~ F. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.
8. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures C ~ F for frequency band from 1 GHz to 10 times carrier frequency.
9. If the reading for the local peak is lower than the Average limit, no further testing is needed in this local peak and this reading should be recorded. If it is higher than Average limit but lower than Peak limit, then set the resolution bandwidth to 1MHz and video bandwidth to 300Hz. Repeat procedures C ~ F. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.

Notes:

1. The frequency range of verification is either from 30 MHz to 1GHz or from 30 MHz up to 10 times carrier frequency of EUT (whichever is the highest frequency range).
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for frequency above 1GHz.

### 4.2.4 TEST SETUP




For the actual test configuration, please refer to the related Item in this test report (**Photographs of the Test Configuration**).

## 4.2.5 TEST RESULTS

**Digital Portion**

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless Access Point | **Model** | WX-1560 |
| **Mode** | Channel 11 | **Detector Function** | Quasi-Peak |
| **Frequency Range** | 30-1000 MHz | **Test Distance** | 3M |
| **Environmental Conditions** | 20℃, 60%RH | **Tested By** | Steven Lu |

| ANTENNA POLARITY: VERTICAL | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (cm) | Table Angle (Degree) |
| 275.00 | 11.87 | 24.13 | 36.0 | 46.0 | -10.0 | 100 | 271 |
| 325.00 | 10.56 | 24.44 | 35.0 | 46.0 | -11.0 | 104 | 61 |
| 350.00 | 9.83 | 28.37 | 38.2 | 46.0 | -7.8 | 132 | 281 |
| 400.02 | 8.18 | 30.92 | 39.1 | 46.0 | -6.9 | 117 | 287 |
| 792.16 | 3.79 | 32.31 | 36.1 | 46.0 | -9.9 | 140 | 40 |
| 880.14 | 2.83 | 32.57 | 35.4 | 46.0 | -10.6 | 132 | 357 |

| ANTENNA POLARITY: HORIZONTAL | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (cm) | Table Angle (Degree) |
| 395.99 | 8.32 | 25.98 | 34.3 | 46.0 | -11.7 | 103 | 357 |
| 400.02 | 8.18 | 31.22 | 39.4 | 46.0 | -6.6 | 100 | 265 |
| 600.04 | 5.75 | 29.05 | 34.8 | 46.0 | -11.2 | 100 | 245 |
| 747.98 | 3.98 | 36.32 | 40.3 | 46.0 | -5.7 | 137 | 74 |
| 792.17 | 3.79 | 33.71 | 37.5 | 46.0 | -8.5 | 145 | 326 |
| 880.17 | 2.83 | 32.17 | 35.0 | 46.0 | -11.0 | 110 | 201 |

Notes:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

## RF Portion

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless Access Point | **Model** | WX-1560 |
| **Mode** | Channel 1 | **Detector Function** | Peak<br>Average |
| **Frequency Range** | Above 1000 MHz | **Test Distance** | 3M |
| **Environmental Conditions** | 20℃, 60%RH | **Tested By** | Steven Lu |

| **ANTENNA POLARITY: Vertical** | | **Detector Function :** | | | | **6dB Bandwidth : 1MHz** | | | | **Frequency Range : Above 1GHz** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV/m) | | Limit (dBuV/m) | | Margin (dB) | | Antenna Height (cm) | Table Angle (Degree) |
| | | P.K. | A.V. | P.K. | A.V. | P.K. | A.V. | P.K | A.V. | | |
| 2038.0 | 34.57 | 12.43 | - | 47.0 | - | 74.0 | 54.0 | -27.0 | - | 100 | 219 |
| *2412.9 | 36.09 | 69.41 | 61.6 | 105.5 | 97.7 | - | - | - | - | 135 | 285 |
| 4076.0 | 43.10 | 10.9 | -0.3 | 54.0 | 42.8 | 74.0 | 54.0 | -20.0 | -11.2 | 105 | 326 |
| 4824.0 | 43.73 | 8.87 | - | 52.6 | - | 74.0 | 54.0 | -21.4 | - | 100 | 285 |

| **ANTENNA POLARITY: Horizontal** | | **Detector Function :** | | | | **6dB Bandwidth:1MHz** | | | | **Frequency Range: Above 1GHz** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV/m) | | Limit (dBuV/m) | | Margin (dB) | | Antenna Height (cm) | Table Angle (Degree) |
| | | P.K. | A.V. | P.K. | A.V. | P.K. | A.V. | P.K | A.V. | | |
| 2038.2 | 34.57 | 13.88 | - | 48.5 | - | 74.0 | 54.0 | -25.5 | - | 114 | 167 |
| *2410.1 | 36.09 | 59.11 | 51.9 | 95.2 | 88.0 | - | - | - | - | 106 | 144 |
| 4075.9 | 43.10 | 10.70 | - | 53.8 | - | 74.0 | 54.0 | -20.2 | - | 105 | 227 |
| 4824.5 | 43.73 | 8.47 | - | 52.2 | - | 74.0 | 54.0 | -21.8 | - | 104 | 249 |

**NOTES:** 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless Access Point | **Model** | WX-1560 |
| **Mode** | Channel 6 | **Detector Function** | Peak<br>Average |
| **Frequency Range** | Above 1000 MHz | **Test Distance** | 3M |
| **Environmental Conditions** | 20℃, 60%RH | **Tested By** | Steven Lu |

| **ANTENNA POLARITY: Vertical** | | **Detector Function :** | | | | **6dB Bandwidth:1MHz** | | | | **Frequency Range: Above 1GHz** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV/m) | | Limit (dBuV/m) | | Margin (dB) | | Antenna Height (cm) | Table Angle (Degree) |
| | | P.K. | A.V. | P.K. | A.V. | P.K. | A.V. | P.K | A.V. | | |
| 2063.0 | 34.78 | 13.55 | - | 48.3 | - | 74.0 | 54.0 | -25.7 | - | 100 | 105 |
| *2436.9 | 36.37 | 66.13 | 59.0 | 102.5 | 95.4 | - | - | - | - | 112 | 325 |
| 4126.0 | 42.71 | 11.54 | 1.29 | 54.2 | 44.0 | 74.0 | 54.0 | -19.8 | -10 | 107 | 135 |
| 4874.9 | 43.75 | 8.95 | - | 52.7 | - | 74.0 | 54.0 | -21.3 | - | 118 | 269 |

| **ANTENNA POLARITY: Horizontal** | | **Detector Function :** | | | | **6dB Bandwidth:1MHz.** | | | | **Frequency Range: Above 1GHz.** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV/m) | | Limit (dBuV/m) | | Margin (dB) | | Antenna Height (cm) | Table Angle (Degree) |
| | | P.K. | A.V. | P.K. | A.V. | P.K. | A.V. | P.K | A.V. | | |
| 2063.1 | 34.78 | 14.28 | - | 49.1 | - | 74.0 | 54.0 | -24.9 | - | 113 | 342 |
| *2437.8 | 36.37 | 56.33 | 48.5 | 92.7 | 84.9 | - | - | - | - | 105 | 197 |
| 4126.0 | 42.71 | 9.99 | - | 52.7 | - | 74.0 | 54.0 | -21.3 | - | 124 | 362 |
| 4874.2 | 43.75 | 7.88 | - | 51.6 | - | 74.0 | 54.0 | -22.4 | - | 99 | 284 |

**NOTES:** 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless Access Point | **Model** | WX-1560 |
| **Mode** | Channel 11 | **Detector Function** | Peak<br>Average |
| **Frequency Range** | Above 1000 MHz | **Test Distance** | 3M |
| **Environmental Conditions** | 20℃, 60%RH | **Tested By** | Steven Lu |

| **ANTENNA POLARITY: Vertical** | | **Detector Function :** | | | | **6dB Bandwidth:1MHz.** | | | | **Frequency Range: Above 1GHz** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV/m) | | Limit (dBuV/m) | | Margin (dB) | | Antenna Height (cm) | Table Angle (Degree) |
| | | P.K. | A.V. | P.K. | A.V. | P.K. | A.V. | P.K | A.V. | | |
| 2088.1 | 35.07 | 12.8 | - | 47.9 | - | 74.0 | 54.0 | -26.1 | - | 99 | 85 |
| *2462.9 | 36.44 | 63.7 | 56.1 | 100.1 | 92.5 | - | - | - | - | 104 | 243 |
| 4176.0 | 42.76 | 9.99 | - | 52.8 | - | 74.0 | 54.0 | -21.2 | - | 100 | 317 |
| 4924.8 | 43.27 | 6.93 | - | 50.2 | - | 74.0 | 54.0 | -23.8 | - | 100 | 337 |

| **ANTENNA POLARITY: Horizontal** | | **Detector Function :** | | | | **6dB Bandwidth:1MHz.** | | | | **Frequency Range: Above 1GHz** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV/m) | | Limit (dBuV/m) | | Margin (dB) | | Antenna Height (cm) | Table Angle (Degree) |
| | | P.K. | A.V. | P.K. | A.V. | P.K. | A.V. | P.K | A.V. | | |
| 2088.1 | 35.07 | 13.93 | - | 49.0 | - | 74.0 | 54.0 | -25.0 | - | 116 | 180 |
| *2461.8 | 36.44 | 54.26 | 44.7 | 90.7 | 81.1 | - | - | - | - | 112 | 168 |
| 4176.0 | 42.76 | 10.58 | - | 53.3 | - | 74.0 | 54.0 | -20.7 | - | 111 | 4 |
| 4924.8 | 43.27 | 7.91 | - | 51.2 | - | 74.0 | 54.0 | -22.8 | - | 100 | 186 |

**NOTES:** 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

## 4.3 6dB BANDWIDTH MEASUREMENT

### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The Limit of 6dB Bandwidth Measurement is 0.5 MHz.

### 4.3.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| ROHDE & SCHWARZ TEST RECEIVER | ESMI | 846839/018<br>848926/005 | Mar. 03, 2001 |
| HP ATTENUATOR | 8496B | 3247A18505 | Cal. on use |
| HP PLOTTER | 7475A | 2641V27755 | N/A |

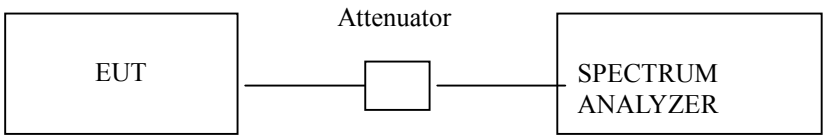
Notes:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

### 4.3.4 TEST SETUP




For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

### 4.3.5 EUT OPERATING CONDITION

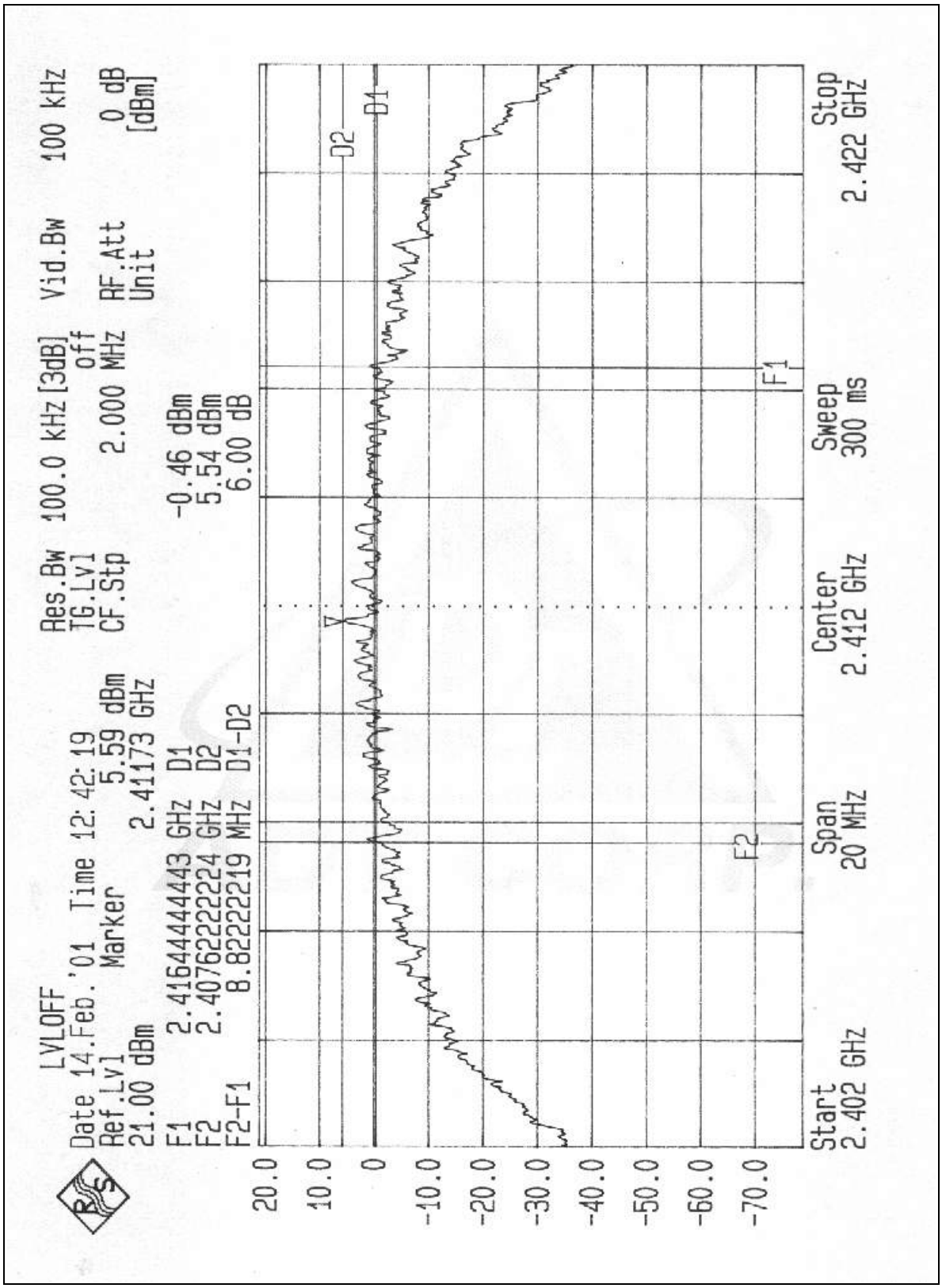
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

## 4.3.6 TEST RESULTS

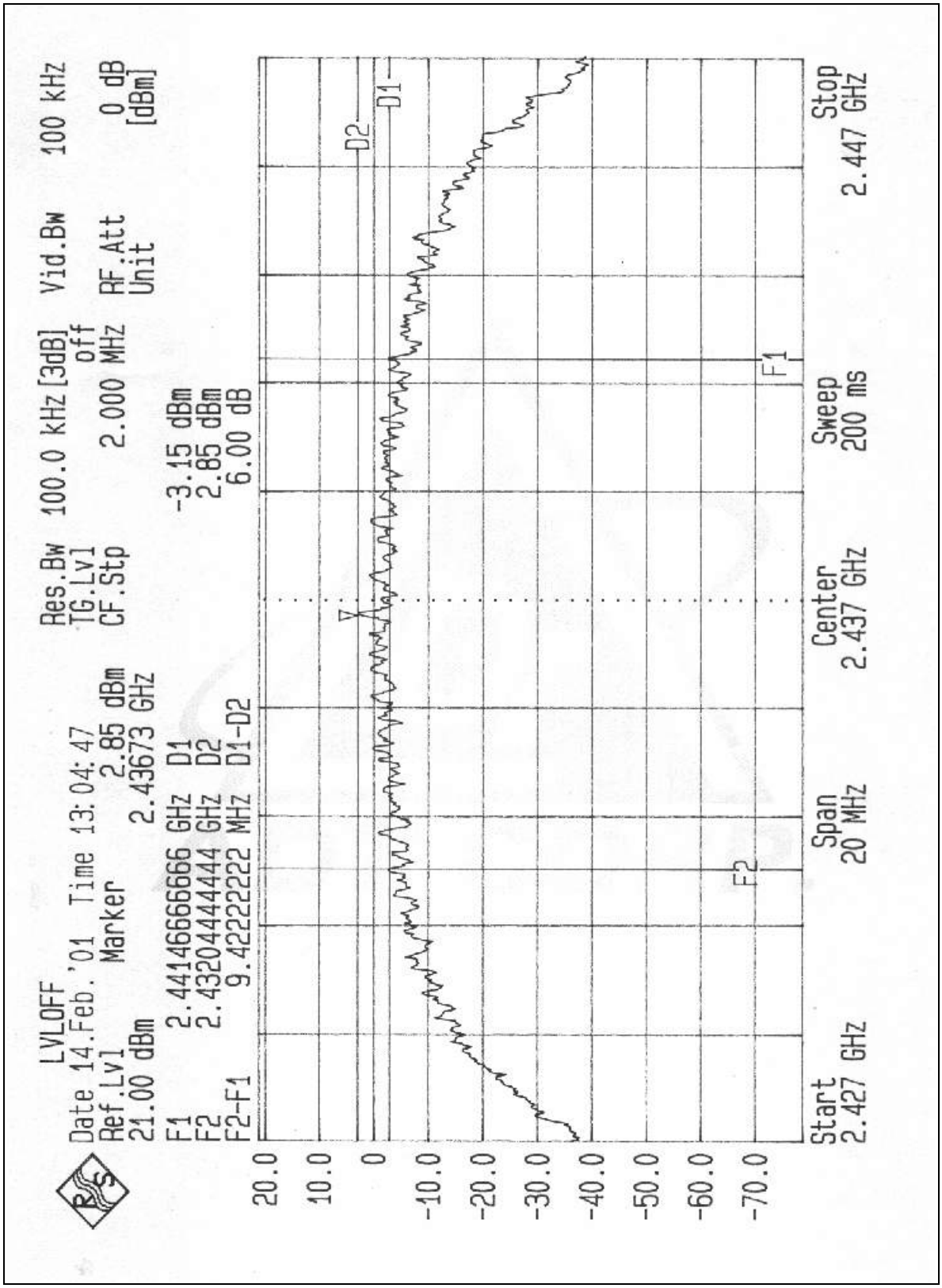
| | | | |
|---|---|---|---|
| **EUT** | 2.4GHz Wireless Access Point | **Model** | WX-1560 |
| **Environmental Conditions** | 20℃, 60%RH | **Tested By** | Steven Lu |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6 dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS/FAIL |
|---|---|---|---|---|
| 1 | 2412 | 8.82 | 0.5 | PASS |
| 6 | 2437 | 9.42 | 0.5 | PASS |
| 11 | 2462 | 9.47 | 0.5 | PASS |

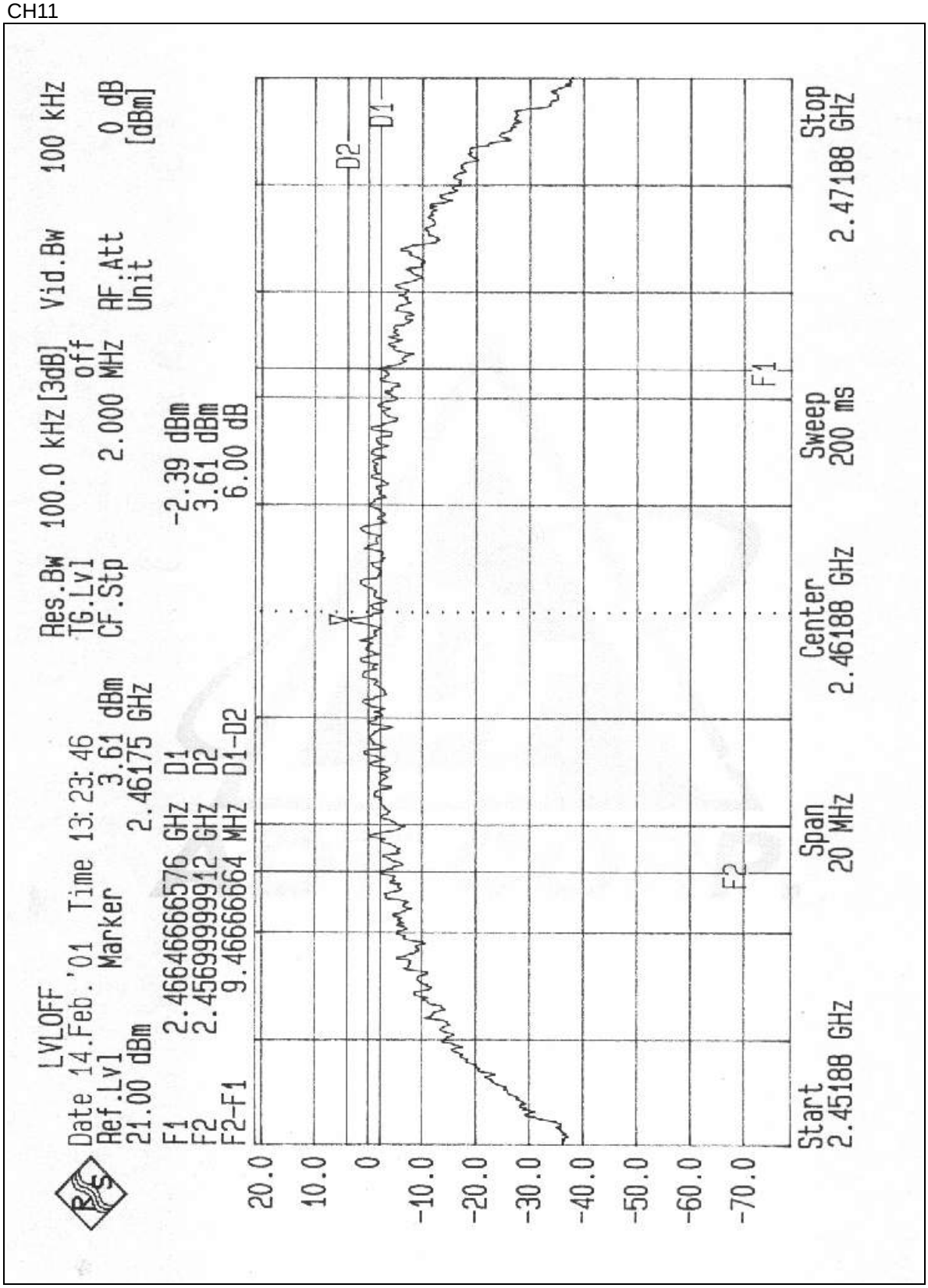
CH1


LVLOFF
Date 14.Feb.'01 Time 12:42:19
Ref.Lvl Marker 5.59 dBm
21.00 dBm 2.41173 GHz
F1 2.416444443 GHz D1
F2 2.407622224 GHz D2
F2-F1 8.82222219 MHz D1-D2
Res.Bw 100.0 kHz [3dB] Vid.Bw 100 kHz
TG.Lvl off
CF.Stp 2.000 MHz RF.Att 0 dB
Unit [dBm]
-0.46 dBm
5.54 dBm
6.00 dB
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D2
D1
F1
F2
Start 2.402 GHz
Span 20 MHz
Center 2.412 GHz
Sweep 300 ms
Stop 2.422 GHz

CH6


LVLOFF
Date 14.Feb.'01 Time 13:04:47
Ref.Lvl
21.00 dBm
Marker
F1 2.44146666666 GHz D1 2.85 dBm
F2 2.43204444444 GHz D2 2.43673 GHz
F2-F1 9.42222222 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-3.15 dBm
2.85 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D2
D1
F1
F2
Start 2.427 GHz
Span 20 MHz
Center 2.437 GHz
Sweep 200 ms
Stop 2.447 GHz

CH11


LVLOFF
Date 14.Feb.'01 Time 13:23:46
Ref.Lvl 3.61 dBm
21.00 dBm Marker 2.46175 GHz
F1 2.46466666576 GHz D1
F2 2.45699999912 GHz D2
F2-F1 9.46666664 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-2.39 dBm
3.61 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
D2
D1
F1
F2
Start 2.45188 GHz
Span 20 MHz
Center 2.46188 GHz
Sweep 200 ms
Stop 2.47188 GHz